Lesson 1.1 Introduction to the Environment

Curriculum for Sustainability

Topic I

Introducing Environmental Issues and Sustainability

Module 1: Environmental science, sustainability, ethics and inquiry

Key Concepts:

The environment is made up of all living and non-living things that affect an organism during its life.

An "environment" is not static.

The concept of "environment" is different for different organisms. For example, the environment of an earthworm would include soil, plant roots, water, etc. and be confined to a relatively small area usually underground whereas the environment for a fish may be a pond or river and include water, plants, other fish, dissolved oxygen, etc.

The environment of an organism changes over time as the organism's needs and abilities change and through the influence of external factors.

Terminology:

Environment: The ecological definition of environment is: all factors living and nonliving that affect an organism or population of organisms at any point in their lifecycle.

Biotic Environment: The living part of an organism's environment

Abiotic Environment: The non-living part of an organism's environment

Defining Environment: The ecological definition of environment is: all factors living and nonliving that affect an organism or population of organisms at any point in their lifecycle.

An organism's environment includes:

- Where it lives
- What it eats
- Air, water, nutrients, substrate
- Other organisms
    - Any organism that affects the target organism throughout its life such as:
        - Predators, prey, cohabitants, competitors, mutualists, commensalists, parasites, etc.

- Family, friends, teachers, etc.
- Climate, weather, temperature, sunlight, etc.

The Powerpoint presentation 1.1ENVIRONMENT.pptx is available as a companion to this lesson

Possible discussion topics or writing prompts:

- What do we think of when we hear the word "environment?"
- How does our definition of "environment" differ from the ecological definition, or does it?
- Is our concept of environment always the same (example, when you think of a sea turtle's environment, is it the same as the environment of an oak tree?)
- Why do you think that the environment is important to people? (Definition: factors that affect an organism. Humans are interconnected with their environment just like all other animals, and maybe more so, since we live in so many different types of places.)
- Choose an organism, describe its environment and discuss how that environment may change over time.
- Compare and contrast the environment of two different common organisms (ex: Rabbit and Squirrel, Cow and Shark, Robin and Flower)
- Compare and contrast the environment of two similar organisms that live in different places (ex: House Cat and Alley Cat, Tree in the forest and Tree in the park, Fish in a fish tank and Fish in the ocean)

<u>Activities</u>:

- Provide photos of well-known organisms from the local area (squirrel, oak tree, butterfly, hawk, fish) and in small groups, ask the students to list all of the factors that make up their organism's environment.

  Options:
  - Have students then individually write a haiku describing their organism's environment.
  - Have the students draw a picture of their organism including its environment

- Ask the students to list some factors that make up their personal environment and create a big list or a word cloud.

  Option:
  - Have the students draw a picture of their environment.

  Discussion or writing Prompt: Describe your personal environment when you were a baby. How was your environment then different than your environment now?

What do you think your environment will be like in 10 years? How will your future environment be different from your environment now?

- Create a healthy environment for a plant (terrarium):
  - Building a terrarium: chose simple plants or animals (snails are good) and discuss what is absolutely essential for that animal to survive and reproduce throughout its lifecycle. Those factors make up the organism's environment.
  - Directions for building a terrarium from 2 liter bottles are available

You can provide mason jars or plastic 2 liter recycled bottles and have small groups or individuals create their own terrariums or make one with the entire group.

MATH

Option: Turn building a terrarium into your math lesson: ask students to calculate the volume of the bottom of the terrarium.

Once the students have built their terrariums, ask them estimate and then to calculate the amount of soil that is in the terrarium. What percent of the area of the terrarium is each material?

SCIENCE

Option: Turn your terrariums into an experiment. Plant the same seeds or plants in each terrarium but vary the amount of water and/or sunlight that they receive. Ask the students to make a hypothesis about what effects the variations in the environment will have on the plants' growth and survival. Have the students check the plants once per day and record when the seeds germinate and the plant height each day. At the end of the experiment, the results can be graphed and analyzed to either support or reject the students' hypotheses.